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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/798,160	03/11/2004	Stephen Morphet	R&G C-327A	5095

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EXAMINER	
SINGH, DALIP K	
ART UNIT	PAPER NUMBER
2628	

DATE MAILED: 08/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/798,160	MORPHET, STEPHEN	
	Examiner	Art Unit	
	Dalip K. Singh	2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 August 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13,16 and 17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13,16,17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This Office Action is in response to applicant's amendment dated August 10, 2005 in response to PTO Office Action dated February 7, 2005. The amendments to claim(s) 1; the deletion of claim(s) 14 and 15; and the addition of claim(s) 16 and 17 have been noted and entered in the record, and applicant's remarks have been carefully considered resulting in the action as set forth herein below.

2. Based on applicant's amendment to claim 1, the rejection under 35 U.S.C. §112 has been withdrawn.

3. Regarding applicant's argument with respect to claim 1, that ,"Kenworthy does not disclose a method for optimizing a display list memory whereby object data stored in a display list is partially rendered and then stored in a local memory so as to free up space in the display list memory", this limitation is not recited in the instant claim. Kenworthy is relevant to subdivision of image into plurality of rectangular areas; loading object data into display list memory etc. as detailed in office action. Kenworthy **discloses** a frame buffer memory in the form of compositing buffer 210 (...images are read from shared memory 216, transformed to physical output device coordinates by the gsprite engine 204, composited in the compositing buffer 210, transferred to the DAC 212, and then transferred to an output device...col. 14, lines 35-42;...after compositing pixel data, the image processor then transfers composited pixel data to an output device...col. 16, lines 13-15;...The compositing buffer 480 is a specialized memory device that is used to composite gsprite data from the gsprite engine and generate digital video data to transfer to the DAC 212...col. 28, lines 32-39;...the compositing buffer 480 interfaces to the gsprite engine 204, and transfers image data to the DAC 212...col. 29, lines 1-4).

4. Regarding applicant's argument with respect to claims 7 and 10, that, "by dividing the image into macro-tiles and tiles, or larger and smaller rectangular areas, the claimed invention

is able to balance the conflicting requirements of memory wastage, caused by parameter duplication", again this claim limitation is not recited in the instant claim. Kenworthy is still relevant as to subdivision of image into plurality of rectangular areas.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claim(s) 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,852,443 to Kenworthy.

a. Regarding claim 1, Kenworthy **discloses** subdividing the image into a plurality of rectangular areas (...the image processor divides the gsprites into image regions called "chunks"...col. 13, lines 43-55...tiler checks the current chunk size to determine how to sub-divide...col. 36, lines 25-67); loading object data for each rectangular area into a display list memory until that memory is substantially full (...processing proceeds until...fragment buffer overflows...col. 4, lines 30-56), the pixel (element 408, Fig. 9A) and fragment buffer(s) (element 410, Fig. 9A) being similar to the display list memory as per the claim 1 limitation, where a check is maintained on the fragment buffers to see if it is substantially full; deriving image data and shading data for each picture element (...the pixel buffer entry includes the following data...where R, G, B...Z components...represents the depth of the pixel...col. 33, lines 67; col. 34, lines 1-17...the fragment buffer is used to store information about pixel fragments...each entry in the fragment buffer provides color, α, Z and coverage data associated with the surface...col. 34, lines 24-55...the pixel engine performing the pixel level calculations...col. 33, lines 23-25); storing the image

data and the shading data (...the anti-aliasing engine 412 transfers resolved pixel data to the compression engine...sends the compressed data to...for storage in shared memory 216...col. 19, lines 15-30); loading further object data into the display list memory to replace the existing contents (...once all the polygons for the chunk are rendered...the pixel engine writes pixel data for the next chunk in the other pixel buffer and the remaining free location in the fragment buffer...col. 33, lines 51-60); retrieving the stored image data and shading data; deriving additional image data and from the new object data and the previously derived image data and shading data (...the tiler 378 includes a number of components for primitive rendering...the command and memory control 380 includes an interface to shared memory 216...accesses to memory...are arbitrated by this block...col. 17, lines 22-27...the texture cache 402 stores blocks of decompressed image data...the decompression engine 404 decompresses texture data and transfers it to the texture cache 402...col. 18, lines 28-45), although Kenworthy does not disclose retrieval and deriving of all image data, new or previously derived, all data is stored in the shared memory and passes through the texture cache, and similar to the retrieval and deriving image data as per the claim limitation; repeating and providing the shading data to a frame buffer memory (...Kenworthy **discloses** a frame buffer memory in the form of compositing buffer 210...images are read from shared memory 216, transformed to physical output device coordinates by the gsprite engine 204, composited in the compositing buffer 210, transferred to the DAC 212, and then transferred to an output device...col. 14, lines 35-42;...after compositing pixel data, the image processor then transfers composited pixel data to an output device...col. 16, lines 13-15;...The compositing buffer 480 is a specialized memory device that is used to composite gsprite data from the gsprite engine and generate digital video data to transfer to the DAC 212...col. 28, lines 32-39;...the compositing buffer 480 interfaces to the gsprite engine

204, and transfers image data to the DAC 212...col. 29, lines 1-4) for display is **implicitly implied** (...after completing processing of any remaining sub-chunks, the tiler proceeds to the next chunk. Processing ultimately terminates when there are no further chunks in the input data stream...col. 37, lines 35-38). Therefore, it would have been obvious to a person of ordinary skill in the art at the time invention was made to consider that storage of data in shared memory (element 216, Fig. 4A) and data transfer through the texture cache to be similar to the retrieval and deriving image data as per the claim limitation (col. 11, lines 55-67; col. 12, lines 8-13).

b. Regarding claim 2, Kenworthy **discloses** image data comprising object identification data (...the gsprite is divided into chunks by dividing the rectangular image region into chunks and associating these chunks with the gsprite data structure..col. 13, lines 52-55) and depth data (...Z is the component which represents the depth of the pixel...col. 34, lines 1-15).

c. Regarding claim 3, Kenworthy **discloses** the steps of compressing the image data prior to step d and decompressing the compressed image data prior to step g (col. 18, lines 28-45; col. 19, lines 15-30).

d. Regarding claim 4, it is similar in scope to claim 1 and is rejected under the same rationale.

e. Regarding claim 5, it is similar in scope to claim 2 and is rejected under the same rationale.

f. Regarding claim 6, it is similar in scope to claim 3 and is rejected under the same rationale.

g. Regarding claim 7, the claim limitation recites frame store means for storing the shading data for tiled data. Kenworthy **discloses** a chunking architecture being well-suited for image sub-division, it further **suggests** similar technique being equally

applicable to a full frame buffer being decomposed into smaller regions to reduce fragment memory requirement, and as such it would have been obvious to a person of ordinary skill in the art at the time invention was made to use similar arrangement for a frame store means as recited by the claim 7 limitation for the reasons cited above (col. 38, lines 15-25).

h. Regarding claim 8, wherein the claim limitation states releasing blocks of storage for further object data, Kenworthy **discloses** such an arrangement (col. 33, lines 51-60).

i. Regarding claim 9, Kenworthy **implicitly discloses** image data comprising a sequence of frames of data (col. 4, lines 21-41).

j. Regarding claim 10, it is similar in scope to claim 7 and is rejected under the same rationale.

7. Claim(s) 11, 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,852,443 to Kenworthy in view of US 6,701,420 B1 to Hamilton et al.

a. Regarding claim 11, Kenworthy **does not disclose** wherein a predetermined number of blocks of the display list memory have been allocated to rectangular areas, and commencing the supply of data to the shading means in dependence on the determination, thereby releasing blocks of storage for further object data. Hamilton et al. **discloses** memory manager 304 dynamically creating and managing a logical association of memory blocks for storage of display lists; with memory manager 304 allocating memory blocks to display lists when required and maintaining the status of those memory blocks or portions thereof which are not currently being used to store a display list so that they are available for future allocation (col. 13, lines 23-34). Although Hamilton does not specifically make use of determining of predetermined number of blocks being used, it does dynamically allocates and deallocates blocks for usage of display list. Therefore, it would have been obvious to a person of ordinary skill in the art

at the time invention was made to modify the device taught by Kenworthy with the feature "dynamically creating and managing a logical association of memory blocks for storage of display lists" as taught by Hamilton et al. **because** it results in elimination of the need to issue additional system-calls thus providing efficient system performance.

b. Regarding claims 12 and 13, Kenworthy **discloses** subdividing the image data into a plurality of substantially rectangular areas (...the image processor divides the gsprites into image regions called "chunks"...col. 13, lines 43-55...tiler checks the current chunk size to determine how to sub-divide...col. 36, lines 25-67); means for storing data pertaining to surfaces making up the image in a display list memory (...processing proceeds until...fragment buffer overflows...col. 4, lines 30-56), the pixel (element 408, Fig. 9A) and fragment buffer(s) (element 410, Fig. 9A) being similar to the display list memory; means for allocating at least one block of storage from the display list memory to each rectangular area (...the tiler can use a common buffer with a free list. The free list represents free memory in the common buffer that is allocated as new fragment records are generated and added to when fragment records are resolved...col. 14, lines 25-29), means for storing in that block of memory data pertaining to surfaces which intersect that rectangular area (...the preprocessor selects potentially visible objects by traversing objects and determining whether their boundaries intersect the view volume. Objects that intersect the view volume are potentially visible in the geometric or spatial sense...col. 12, lines 63-67;...rendering to separate gsprites will always be more computationally efficient, so if the system has the memory and compositing capacity, non-intersecting objects should be redered into separate gsprites...col. 13, lines 35-39), although Kenworthy **does not disclose explicitly** storing in that block of memory data pertaining to surfaces which intersect that rectangular area, Kenworthy **does disclose** processing objects that intersect the view volume and therefore it would have

been obvious to a person of ordinary skill in the art at the time invention was made to allocate memory for storing such objects **because** this would provide for efficient processing of visible objects; means for supplying data for each rectangular area from the display list to a means for deriving shading data for each picture element of the rectangular area, and frame store means for storing the shading data for display (...Kenworthy **discloses** a frame buffer memory in the form of compositing buffer 210...images are read from shared memory 216, transformed to physical output device coordinates by the gsprite engine 204, composited in the compositing buffer 210, transferred to the DAC 212, and then transferred to an output device...col. 14, lines 35-42;...after compositing pixel data, the image processor then transfers composited pixel data to an output device...col. 16, lines 13-15;...The compositing buffer 480 is a specialized memory device that is used to composite gsprite data from the gsprite engine and generate digital video data to transfer to the DAC 212...col. 28, lines 32-39;...the compositing buffer 480 interfaces to the gsprite engine 204, and transfers image data to the DAC 212...col. 29, lines 1-4) for display is **implicitly implied**. Kenworthy **does not disclose** characterized in that the means for allocating blocks of storage from the display list memory determines when a predetermined number of blocks have been used and, in dependence on the determination, causes the means for supplying data to the means for deriving shading data to commence operation, thereby releasing blocks of storage for further rectangular areas. Hamilton et al. **discloses** memory manager 304 dynamically creating and managing a logical association of memory blocks for storage of display lists; with memory manager 304 allocating memory blocks to display lists when required and maintaining the status of those memory blocks or portions thereof which are not currently being used to store a display list so that they are available for future allocation (col. 13, lines 23-34). Although Hamilton does not specifically make use of

determining of predetermined number of blocks being used, it does dynamically allocates and deallocates blocks for usage of display list. Therefore, it would have been obvious to a person of ordinary skill in the art at the time invention was made to modify the device taught by Kenworthy with the feature "dynamically creating and managing a logical association of memory blocks for storage of display lists" as taught by Hamilton et al. **because** it results in elimination of the need to issue additional system-calls thus providing efficient system performance.

c. Regarding claim 16, Kenworthy **discloses** subdividing image data into plurality of substantially rectangular areas (...the image processor divides the gsprites into image regions called "chunks"...col. 13, lines 43-55...tiler checks the current chunk size to determine how to sub-divide...col. 36, lines 25-67) the chunks are similar to a macro-area; a display list memory for storing data (...processing proceeds until...fragment buffer overflows...col. 4, lines 30-56), the pixel (element 408, Fig. 9A) and fragment buffer(s) (element 410, Fig. 9A) being similar to the display list memory; means for storing data concerning surfaces that intersect a specified rectangular area of the image into the at least one allocated storage block of the corresponding portion of the display list memory (...the preprocessor selects potentially visible objects by traversing objects and determining whether their boundaries intersect the view volume. Objects that intersect the view volume are potentially visible in the geometric or spatial sense...col. 12, lines 63-67;...rendering to separate gsprites will always be more computationally efficient, so if the system has the memory and compositing capacity, non-intersecting objects should be redered into separate gsprites...col. 13, lines 35-39), although Kenworthy **does not disclose explicitly** storing in that block of memory data pertaining to surfaces which intersect that rectangular area, Kenworthy **does disclose** processing objects that intersect the view volume and therefore it would have been

obvious to a person of ordinary skill in the art at the time invention was made to allocate memory for storing such objects **because** this would provide for efficient processing of visible objects; means for allocating at least one of the storage blocks of a selected portion of the display list memory to each rectangular area of the corresponding macro-area (...the tiler can use a common buffer with a free list. The free list represents free memory in the common buffer that is allocated as new fragment records are generated and added to when fragment records are resolved...col. 14, lines 25-29); means for supplying, for each picture element of each rectangular area of each macro-area of the image, data from the display list memory to a means for deriving shading data; and frame store means for storing the derived shading data for display (...Kenworthy **discloses** a frame buffer memory in the form of compositing buffer 210...images are read from shared memory 216, transformed to physical output device coordinates by the gsprite engine 204, composited in the compositing buffer 210, transferred to the DAC 212, and then transferred to an output device...col. 14, lines 35-42;...after compositing pixel data, the image processor then transfers composited pixel data to an output device...col. 16, lines 13-15;...The compositing buffer 480 is a specialized memory device that is used to composite gsprite data from the gsprite engine and generate digital video data to transfer to the DAC 212...col. 28, lines 32-39;...the compositing buffer 480 interfaces to the gsprite engine 204, and transfers image data to the DAC 212...col. 29, lines 1-4) for display is **implicitly implied**. Kenworth **is silent about** the display list memory being divided into portions corresponding to each of the defined macro-areas with each portion comprising a plurality of storage blocks. Hamilton et al. **discloses** memory manager 304 dynamically creating and managing a logical association of memory blocks for storage of display lists; with memory manager 304 allocating memory blocks to display lists when required and maintaining the status of those memory blocks

or portions thereof which are not currently being used to store a display list so that they are available for future allocation (col. 13, lines 23-34). Although Hamilton does not specifically make use of determining of predetermined number of blocks being used, it does dynamically allocates and deallocates blocks for usage of display list. Therefore, it would have been obvious to a person of ordinary skill in the art at the time invention was made to modify the device taught by Kenworthy with the feature "dynamically creating and managing a logical association of memory blocks for storage of display lists" as taught by Hamilton et al. **because** it results in elimination of the need to issue additional system-calls thus providing efficient system performance.

d. Regarding claim 17, it is similar in scope to claim 16 above and is rejected under the same rationale.

Conclusion

8. Applicant's argument presented are not persuasive. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Dalip K. Singh** whose telephone number is **(571) 272-7792**. The examiner can normally be reached on Mon-Friday (10:30AM-6: 30PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Ulka Chauhan**, can be reached at **(571) 272-7782**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, please contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). Please note that the new Central Official FAX number for application specific communications with the USPTO is **571-273-8300** (effective July 15, 2005).

Dalip K. Singh
Examiner , Art Unit 2671

dks
August 4, 2006

ULKA CHAUHAN
SUPERVISORY PATENT EXAMINER